

**DESCRIPTION**

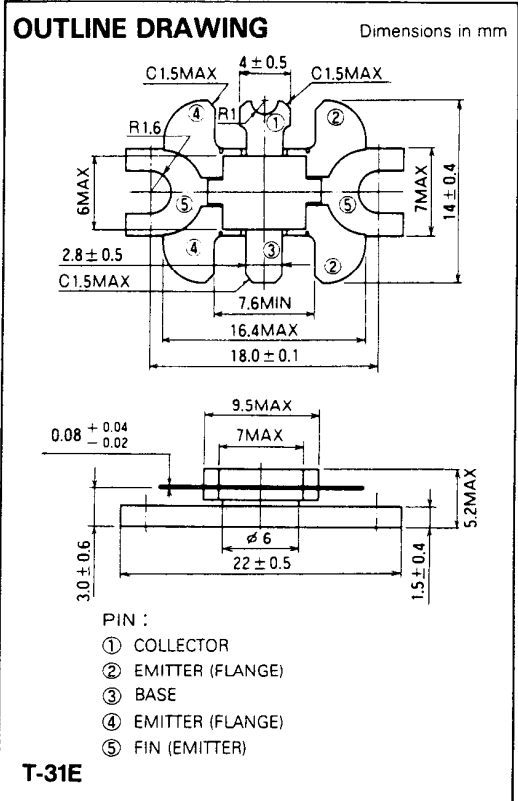
2SC3021 is a silicon NPN epitaxial planar type transistor specifically designed for UHF power amplifiers applications.

**FEATURES**

- High power gain:  $G_{pe} \geq 7.6\text{dB}$   
@  $V_{CC} = 12.5\text{V}$ ,  $f = 520\text{MHz}$ ,  $P_{in} = 1.2\text{W}$ .
- Emitter ballasted construction.
- High ruggedness: Ability to withstand more than 20:1 load VSWR when operated at  $V_{CC} = 15.2\text{V}$ ,  $f = 520\text{MHz}$ ,  $P_O = 7\text{W}$ .
- Flange type ceramic package.
- $Z_{in} = 2.2 + j3.1\Omega$ ,  
 $Z_{out} = 6 + j1.0\Omega$  @  $V_{CC} = 12.5\text{V}$ ,  $f = 520\text{MHz}$ ,  $P_O = 7\text{W}$ .

**APPLICATION**

For output stage of 5W power amplifiers and drive stage of higher power amplifiers in UHF band.



**ABSOLUTE MAXIMUM RATINGS** ( $T_C = 25^\circ\text{C}$ )

Symbol	Parameter	Conditions	Rating	Unit
$V_{CBO}$	Collector to base voltage		35	V
$V_{EBO}$	Emitter to base voltage		4	V
$V_{CEO}$	Collector to emitter voltage	$R_{BE} = \infty$	17	V
$I_C$	Collector current		2	A
$P_C$	Collector dissipation	$T_C = 25^\circ\text{C}$	20	W
$T_j$	Junction temperature		175	$^\circ\text{C}$
$T_{stg}$	Storage temperature		-55 to 175	$^\circ\text{C}$

Note. Above parameters are guaranteed independently.

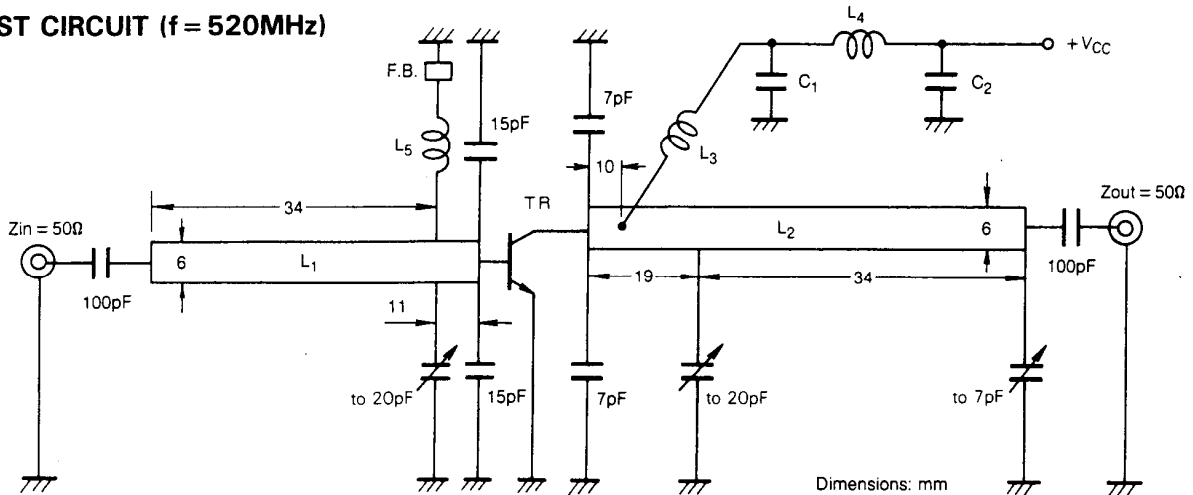
**ELECTRICAL CHARACTERISTICS** ( $T_C = 25^\circ\text{C}$ )

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$V_{(BR)EBO}$	Emitter to base breakdown voltage	$I_E = 5\text{mA}$ , $I_C = 0$	4			V
$V_{(BR)CBO}$	Collector to base breakdown voltage	$I_C = 10\text{mA}$ , $I_E = 0$	35			V
$V_{(BR)CEO}$	Collector to emitter breakdown voltage	$I_C = 50\text{mA}$ , $R_{BE} = \infty$	17			V
$I_{CBO}$	Collector cut off current	$V_{CB} = 15\text{V}$ , $I_E = 0$			500	$\mu\text{A}$
$I_{EBO}$	Emitter cut off current	$V_{EB} = 3\text{V}$ , $I_C = 0$			500	$\mu\text{A}$
$h_{FE}$	DC forward current gain*	$V_{CE} = 10\text{V}$ , $I_C = 0.1\text{A}$	10	50	180	—
$P_O$	Power Output	$V_{CC} = 12.5\text{V}$ , $P_{in} = 1.2\text{W}$ , $f = 520\text{MHz}$	7	7.5		W
$\eta_C$	Collector efficiency		50	60		%

Note. \* Pulse test,  $P_W = 150\mu\text{s}$ , duty = 5%.

Above parameters, ratings, limits and conditions are subject to change.

**TEST CIRCUIT (f = 520MHz)**

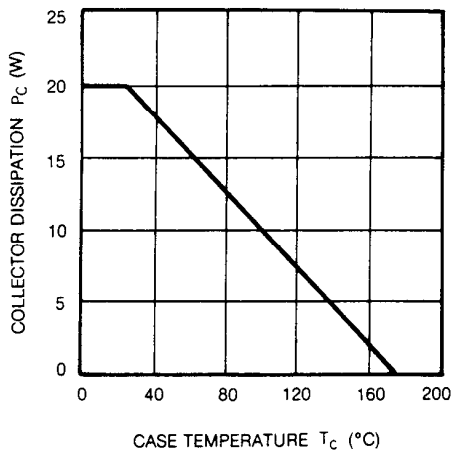


L<sub>1</sub>, L<sub>2</sub>: Microstrip: Board Material 1.6mm Thick, glass-terflon  $\epsilon_r = 2.7$   
 L<sub>3</sub>: 3 Turns AWG #20, 5mm I.D.  
 L<sub>4</sub>: 6 Turns AWG #20, 5mm I.D.  
 L<sub>5</sub>: 10 Turns AWG #26 Enameled Wire on 4mm O.D., 14mm Length Bakelite.

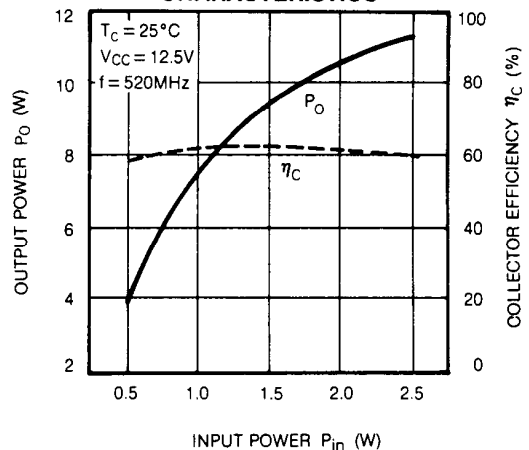
F.B.: Ferrite Bead  
 C<sub>1</sub>: 82pF, 220pF, 4700pF, 10μF in parallel  
 C<sub>2</sub>: 82pF, 220pF, 10μF in parallel

**TYPICAL PERFORMANCE DATA**

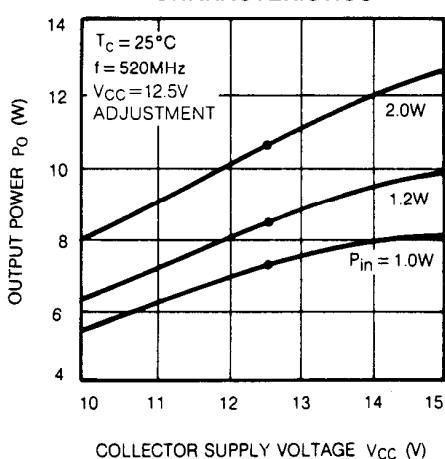
**COLLECTOR DISSIPATION VS. CASE TEMPERATURE CHARACTERISTICS**



**OUTPUT POWER, COLLECTOR EFFICIENCY VS. INPUT POWER CHARACTERISTICS**



**OUTPUT POWER VS. COLLECTOR SUPPLY VOLTAGE CHARACTERISTICS**



**COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE CHARACTERISTICS**

